

**REMARKS/ARGUMENTS**

After the foregoing amendments, claims 5 – 18 and 20 are currently pending in this application. Claims 1 – 4 and 19 have been canceled without prejudice. Claims 5, 10, 14, 15, and 18 have been rewritten in independent form. Claim 17 has been amended to adjust its dependency, and claims 6 – 13, 15 – 17, and 20 have been amended to correct informalities. In the specification, paragraph [0056] has been amended to correctly denote the polymer band with reference numeral 28. Applicants submit that no new matter has been introduced into the application by these amendments.

**Notice of References Cited**

Reference B of PTO-892 (U.S. Patent No. 7,089,997 to Weng et al.) appears to be an erroneous citation. Applicants respectfully request that the Examiner cite U.S. Patent No. 7,089,897 to Schäfer et al. on a PTO-892 for the record.

**Allowable Subject Matter**

The Examiner is thanked for indicating that claims 14 and 18 would be allowable if rewritten in independent form. Claims 14 and 18 have been rewritten accordingly and, thus, are currently in condition for allowance. Reconsideration of these claims is respectfully requested.

**Priority**

The Office Action states that Applicants have not filed a certified copy of German Patent Application No. DE 102 48 351.5 filed October 17, 2002. Applicants respectfully submit that, pursuant to MPEP § 1896(III), a U.S. national stage application filed under 35 U.S.C. § 371 (i.e., the instant application) will have a photocopy of the priority document with the first page stamped by the International Bureau to indicate that it is a priority document received by WIPO and the date of such receipt. Such a photocopy is acceptable in a U.S. national stage application to establish that Applicants have filed a certified copy of the priority document. Applicants respectfully request reconsideration of the outstanding priority document requirement.

**Claim Objections**

Claims 5 – 18 and 20 stand objected to due to informalities. Corrective amendments obviate these objections. Accordingly, withdrawal of the objections to the claims 5 – 18 and 20 is respectfully requested.

**Claim Rejections - 35 U.S.C. § 112**

Claims 10 – 13, 16, and 20 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Corrective amendments to claims 10, 16, and 20 obviate these rejections. Accordingly, withdrawal of the 35 USC § 112 rejections of claims 10 – 13, 16, and 20 is respectfully requested.

**Claim Rejections - 35 USC § 103**

***Willmot and Pierik, each in View of Grashorn***

Claims 5, 6, 10, 15, and 16 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,457,446 to Willmot in view of U.S. Patent No. 3,593,933 to Grashorn, and as unpatentable over U.S. Patent No. 5,680,837 to Pierik in view of Grashorn. Applicants respectfully traverse the rejection of these claims and respectfully submit that these claims are patentable over the art of record for at least the reasons set forth below.

Independent claim 5, as amended, recites features that are neither disclosed nor suggested by Willmot, Pierik, or Grashorn, namely:

...one of the two parts [of the coupling] is formed as the outer part (19, 19'; 33, 33') and the other is formed as the inner part (18, 18'; 34, 34'), and the two parts can be inserted one into the other in a *rotational backlash-free way*, and the coupling is formed as a profiled shaft coupling, preferably as a two-side shaft coupling (4, 4', 4''), which has two coupling surfaces (21, 21') on the outer part (19, 19') and two coupling surfaces (20, 20') on *the inner part* (18, 18'), and preferably *rotational backlash-reducing means are provided on the latter*.

In contrast, and as noted in sections 9 and 13 of the Office Action, each of Willmot and Pierik fails to disclose a coupling being in two parts inserted one into the other and, thus, fails to disclose *rotational backlash-reducing means provided on the inner part of the coupling.*

In further contrast, the collar 2 of Grashorn is inserted in the winding sleeve 3 (Fig. 1), however, there are no backlash reducing means (Fig. 2). A resilient casing 1 is arranged between the collar 2 and the sleeve 3. However, there is a clearly visible clearance between the casing 1 and the collar 2, as illustrated in Fig. 2. Column 2, lines 53 – 59. The casing 1 does not serve the purpose of reducing the backlash between two gearings. A frictional engagement is established between the casing 1 and the sleeve 3, and the casing 1 is driven by the collar 2. The corners of angles 4 strengthen the engagement when a load is applied to the sleeve 3. Column 3, lines 1 – 5. Accordingly, slip between the collar 2 and the sleeve is prevented during operation, i.e., the frictional engagement is maintained even when a load is applied to the sleeve. Notably, however, this is not a backlash-free coupling. Thus, Grashorn neither discloses nor suggests *rotational backlash-reducing means provided on the inner part of the coupling.*

Applicants further note that the claimed adjusting motor of the camshaft adjuster of Applicants' invention operates at high speeds. When the phase of the camshaft is held constant relative to the crankshaft, the adjusting motor (and the coupling) rotates at the speed of the camshaft. To advance the phase, the adjusting motor must rotate even faster. Furthermore, high torque must be generated by the adjusting motor and transmitted via the coupling to change the phase. As for the device of Grashorn, and in stark contrast, a coupling that is utilized to wind filament, threads, or foils (see column 1, line 2 of Grashorn) cannot reasonably be considered by one of ordinary skill in the art who is seeking a solution in a camshaft application. Loads are much higher in camshaft applications. Furthermore, Grashorn states that "the coupling device is particularly distinguished by its operational reliability at low speeds." Column 4, lines 41 – 43.

The adjusting motor of Applicants' invention must accelerate the adjusting shaft when the phase is advanced. Conversely, the adjusting motor must decelerate the adjusting shaft when the phase must be retarded, i.e., the two parts forming the coupling are subject to alternating relative rotational movement. If the coupling of Grashorn was utilized, the clearance between the corners 4 and the protuberances 5 would have a disadvantageous effect when the adjusting motor switches from driving mode into decelerating mode. Moreover, the frictional fit of the casing 1 in the sleeve 3 would not withstand the forces.

Consequently, Applicants contend that one of ordinary skill in the art would not be motivated to utilize a coupling that is utilized to wind filament, threads, or foils (Grashorn) in the camshaft application of Willmot or Pierik. Where modification of the cited art would change a basic principle upon which the disclosed device is designed to operate, the teachings of the references are not sufficient to render the claims obvious. *See, e.g., In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP 2143.01.

Furthermore, because claim 5 includes features that are neither disclosed nor suggested by Willmot, Pierik, or Grashorn, alone or in combination, *prima facie* obviousness cannot be established based on the cited references. Accordingly, Applicants respectfully submit that claim 5 should be allowed. Applicants further respectfully submit that because claim 6 (as amended) is dependent upon allowable claim 5 (as amended), claim 6 should also be allowed at least as dependent upon an allowable base claim. Withdrawal of the 35 U.S.C. § 103(a) rejection of claims 5 and 6 is respectfully requested.

Independent claim 10 (as amended), while not identical to claim 5, includes features that are similar to claim 5. Specifically, claim 10 recites, among other things, one of the two parts [of the coupling] is formed as the outer part and the other is formed as the inner part, and the two parts can be inserted one into the other in a rotational backlash-free way, and the coupling is formed as a tubular

shaft coupling comprising a hollow cylindrical outer part and a coaxial, cylindrical inner part, which is arranged with play in the outer part and which has *rotational backlash-reducing means*. Accordingly, claim 10 is also patentable over the art of record for at least the reasons set forth above. Withdrawal of the 35 U.S.C. § 103(a) rejection of claim 10 is respectfully requested.

Independent claim 15 (as amended), while not identical to claim 5, includes features that are similar to claim 5. Specifically, claim 15 recites, among other things, one of the two parts [of the coupling] is formed as the outer part and the other is formed as the inner part, and the two parts can be inserted one into the other in a *rotational backlash-free way*. Accordingly, claim 15 is also patentable over the art of record for at least the reasons set forth above. Applicants further respectfully submit that because claim 16 (as amended) is dependent upon allowable claim 15 (as amended), claim 16 should also be allowed at least as dependent upon an allowable base claim. Withdrawal of the 35 U.S.C. § 103(a) rejection of claims 15 and 16 is respectfully requested.

***Willmot and Pierik, each in View of Tenfelde***

Claims 5 – 10 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Willmot in view of DE 34 18 544 to Tenfelde, and as unpatentable over Pierik in view of Tenfelde. Applicants respectfully traverse the rejection of these claims and

respectfully submit that these claims are patentable over the art of record for at least the reasons set forth below.

Independent claim 5, as amended, recites features that are neither disclosed nor suggested by Willmot, Pierik, or Tenfelde, namely:

...one of the two parts [of the coupling] is formed as the outer part (19, 19'; 33, 33') and the other is formed as the inner part (18, 18'; 34, 34'), and the two parts can be inserted one into the other in a rotational backlash-free way, and the coupling is formed as a tubular shaft coupling (32, 32') comprising a hollow cylindrical outer part (33, 33') and a coaxial, cylindrical inner part (34, 34'), which is arranged with play in the outer part (33, 33') and which has *rotational backlash-reducing means*.

In contrast, and as noted in sections 10 and 14 of the Office Action, each of Willmot and Pierik fails to disclose a coupling being in two parts inserted one into the other and, thus, fails to disclose *rotational backlash-reducing means provided on the inner part of the coupling*.

In further contrast, the configuration of the coupling of Tenfelde is illustrated in Fig. 7. More specifically, a connector 12 is mounted on each of two coaxially aligned shafts (not shown). The connectors 12 are coupled by a separate sleeve 1. The sleeve 1 is axially inserted into a slot formed in each connector 12. The slot can

be formed in a side face of a one-piece connector 12 (as illustrated in Fig. 6), or the connector 12 can consist of two parts arranged coaxially and fixed to one another (as illustrated in Figs. 3 – 5). The shafts that are coupled are not inserted one into the other, and there is no backlash-reducing means acting between the coupled shafts. Furthermore, an additional sleeve and two additional connectors are utilized. Accordingly, Tenfelde neither discloses nor suggests disclose *rotational backlash-reducing means provided on the inner part of the coupling* and, thus, fails to recite each and every feature of Applicants' claimed invention.

Thus, because claim 5 (as amended) includes limitations that are neither disclosed nor suggested by Willmot, Pierik, or, Tenfelde alone or in combination, *prima facie* obviousness cannot be established based on the cited references. Accordingly, Applicants respectfully submit that claim 5 should be allowed. Applicants further respectfully submit that because claims 6 – 9 (as amended) are dependent upon allowable claim 5 (as amended), claims 6 – 9 should also be allowed at least as dependent upon an allowable base claim. Withdrawal of the 35 U.S.C. § 103(a) rejection of claims 5 – 9 is respectfully requested.

Independent claim 10 (as amended), while not identical to claim 5, includes features that are similar to claim 5. Specifically, claim 10 recites, among other things, one of the two parts [of the coupling] is formed as the outer part and the other is formed as the inner part, and the two parts can be inserted one into the

other in a rotational backlash-free way, and the coupling is formed as a tubular shaft coupling comprising a hollow cylindrical outer part and a coaxial, cylindrical inner part, which is arranged with play in the outer part and which has *rotational backlash-reducing means*. Accordingly, claim 10 is also patentable over the art of record for at least the reasons set forth above. Withdrawal of the 35 U.S.C. § 103(a) rejection of claim 10 is respectfully requested.

*Pierik and Willmot, each in View of Kamiyama*

Claim 17 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Pierik U.S. Patent No. 5,687,690 to Kamiyama et al., and as unpatentable over Willmot in view of Kamiyama. Applicants respectfully submit that because claim 17 (as amended) is dependent upon allowable claim 5 (as amended), claim 17 should also be allowed at least as dependent upon an allowable base claim. Withdrawal of the 35 U.S.C. § 103(a) rejection of claim 17 is respectfully requested.

**Conclusion**

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned at the Examiner's convenience.

**Applicants:** Schäfer et al.  
**Application No.:** 10/531,787

In view of the foregoing amendments and remarks, Applicants respectfully submit that the present application, including claims 5 – 18 and 20, is in condition for allowance, and a Notice to that effect is respectfully requested.

Respectfully submitted,

Schäfer et al.

By Ellen E. Fielitz/  
Ellen E. Fielitz  
Registration No. 54,746

Volpe and Koenig, P.C.  
United Plaza, Suite 1600  
30 South 17th Street  
Philadelphia, PA 19103-4009  
Telephone: (215) 568-6400  
Facsimile: (215) 568-6499

EEF/jyr